Scholarship-Job Title: Opening for 2 Ph.D. Research Assistants in the broadly conceived areas of **Transparency, Trust, and Interpretability in Human-Data Interaction**

The student will be supervised by **Prof. Aritra Dasgupta** (aedeegee.github.io).
Contact him at **aritra.dasgupta@njit.edu** for more details

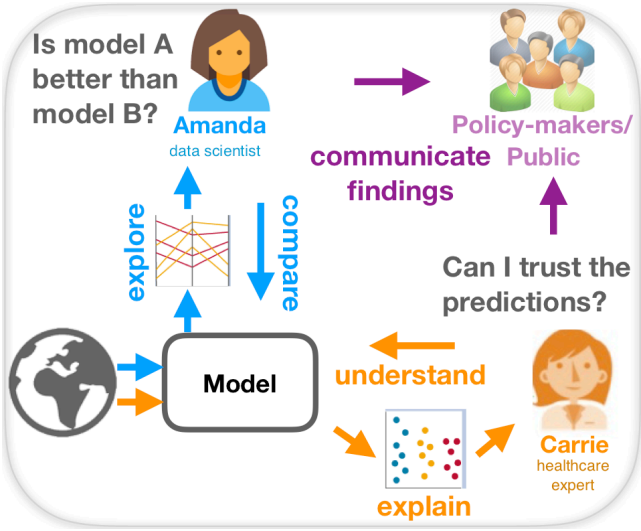
Project description: We live in an era when data promises to save lives, fuel scientific discoveries, and shape opinions and policies. To realize that promise, data producers (e.g., scientists) and consumers (e.g., analysts, public) need appropriate methods using which they can understand and communicate data-driven patterns. However, the growing complexity of analytical models of the computational and analytical models (based on statistics, data mining, machine learning, etc.) often makes it difficult for the human in the data analysis loop to trust the models and consequently, make reliable decisions. To address this challenge, this project will develop and evaluate transparent visual analytics methods for influencing both the process of model building (*"why is model A better than model B?)* and the outcome of the models *("what is the cause behind these patterns?"*). The ultimate goal of this project will be to assess how different levels of analytical transparency affect human-machine trust across different domains and the role visualization plays in human-data interaction.

The following are some topics or their combinations that Ph.D students can expect to work on as part of their dissertation.

Human-data interaction for reliable decision-making: In mission-critical domains (e.g., cyber, medical, etc.), reliable decision-making is the ultimate priority. How can visualizations be used to communicate analytical model outcomes? How can we build interactive visual analytic interfaces that allow analysts to transparently assess decision boundaries and trade-offs?

Characterizing transparency in data analytics and visualization: Data analytics processes are fraught with uncertainty: right from hypothesis formulation to the representation of the data and model outcomes in some visual form. How can we calibrate uncertainty for achieving a high degree of transparency in data analytics processes? How can we implement a visual analytic tool with different levels of transparency for exploring and validating alternative hypotheses?

Guided visual analytics for human-machine trust: Analysts often need guidance for understanding hidden patterns in the data. How can we build effective guidance mechanisms that helps them develop trust in the outcome of the models?



Illustrating how visual analytics can drive transparency in human-data interaction by letting analysts explore alternative models, explain machine-detected patterns, and communicate their findings.

We are looking for candidates that meet the following requirements:

- a solid background in computer science, data science, or a related area with strong interests in data visualization and human-centered research
- Willingness to develop research prototypes.
- Programming experience using Python (especially Jupyter notebooks) and/or Javascript (especially D3 and React)
- Willingness to study and write research papers

We offer:

- a challenging job in a dynamic university with proximity to New York City and a stimulating research environment
- a department equipped with faculty members working in cutting edge research areas, such as data science and visualization, social computing, social media, deep learning, creative artificial intelligence, augmented and virtual reality, etc.
- a full time temporary appointment for a period of 4 years subject to performance assessment
- a potential signing bonus for meritorious international students to help in the transition to a foreign country
- support for career development (conference travel and potential internship positions at national labs)